

AMENDMENTS TO THE DRAWINGS

The attached sheets of drawings includes changes to Figs. 1 and 4.

Attachment: Replacement sheets (2)

REMARKS

Claims 1-3 and 5-7 are pending. The drawings have been amended. No new matter has been added.

Applicant wishes to thank the Examiner for conducting a telephone interview on January 19, 2006. During the interview, Applicant's representative explained that the Examiner's stated motivation for combining Khan and Inoue was contrary to the teachings of Inoue. Applicant's representative explained that the benefits noted by the Examiner as being attributable to inclusion of an n-type delta doped III-N layer, were actually attributable to the removal of the GaN cap layer in the region between the gate and the source. Thus, the Examiner's stated motivation for combining the references was not supported by the prior art. The Examiner agreed with Applicant's representative and noted that he would reconsider the case after filing of a formal response.

The drawings were objected to because elements 19 and 14 appear to be pointing to the same layer in Fig. 1. The same problem exists with elements 79 and 74 of Fig. 4. Accordingly, Figs. 1 and 4 have been amended to properly show these layers as separate. Applicant requests that this objection be withdrawn.

Claims 1, 2, 5 and 6 were rejected under 35 USC 103(a) as being unpatentable over Khan, U.S. Patent No. 5,192,987 in view of Inoue, U.S. Patent No. 6,639,255 B2. This rejection is respectfully traversed.

The Examiner asserts that Khan discloses all of the features of claim 1 except the n-type delta doped III-N layer. However, the Examiner asserts that Inoue discloses an n-type delta doped III-N layer (layer 703), and that it would have been obvious to modify Khan in view of Inoue to provide the claimed n-type delta doped III-N layer because Inoue discloses that the use of such a layer prevents an increase of the source resistance and reduces leakage current. Applicant respectfully disagrees.

First, Inoue does not actually disclose the claimed n-type delta doped III-N layer. Rather, Inoue discloses an electron donor layer 703 composed of AlGa_N to which an n-type impurity such as Si can be added. This does not correspond to the claimed n-type delta doped layer. As described in the specification, “delta doped” denotes a layer in which dopants are doped in an extremely thin layer (paragraph [0024]). Inoue reveals no specific details with regard to the thickness of layer 703. Thus, the Examiner cannot assert that Inoue’s layer is delta doped.

Further, Inoue discloses, in Fig. 7, a device which has a conventional inverted HEMT structure with the addition of an AlGa_N cap layer 705. Layer 703 is a donor layer because it is closely arranged on layer 704, which functions as a channel layer. Layer 703 of Inoue does not function as a layer for reducing source-drain leakage current (parallel conduction), but rather generates 2DEG. Because the claimed n-type delta doped layer is delta doped, it prevents the source-drain leakage current. Inoue actually accomplishes the objective of reduced gate leakage current through the AlGa_N cap layer 705. This is further evidence that layer 703 of Inoue is not a delta doped layer. Thus, the combination of Khan and Inoue fails to teach or suggest the features of claim 1.

Finally, even if Inoue disclosed the claimed n-type delta doped III-N layer, there would have been no motivation to modify Khan in view of Inoue so as to arrive at the claimed invention.

The Examiner asserts that the use of the n-type delta doped III-N layer (n-type AlGa_N electron donor layer 703 of Inoue) prevents an increase of the source resistance and reduces leakage current, and thus one of ordinary skill in the art would have been motivated to have modified Khan to provide this layer. The Examiner cites to col. 10, lines 65-67, to support his assertion. However, this portion of Inoue merely states that prevention of an increase of the source resistance and reduction of leakage current can be expected “from such structure” based on the same reason described in Example 1. Referring back to the discussion of Example 1, specifically col. 6, line 66 to col. 7, line 9, Inoue actually discloses that these benefits arise from removing the Ga_N cap layer in the region between the gate and the source, and that these benefits take the form of reducing the gate-source leakage current and the gate-drain leakage current. The gate leakage current differs

from the source-drain leakage current (parallel conduction) addressed by the applicant. Essentially, these benefits arise because the source electrode and the cap layer do not directly contact each other and the drain electrode and the cap layer also do not directly contact each other. Notably, the benefits are *not* a result of including an n-type delta doped III-N layer, as suggested by the Examiner. Thus, this is not adequate motivation to one of ordinary skill in the art to modify Khan to include such a layer. In accordance with the foregoing, there would have been no motivation to combine these references as asserted by the Examiner.

Claims 2, 5 and 6 are allowable at least due to their respective dependencies. Accordingly, Applicant requests that this rejection be withdrawn.

Claim 3 was rejected under 35 USC 103(a) as being unpatentable over Khan, in view of Inoue and further in view of Phillips, U.S. Patent No. 6,770,902 B2. This rejection is respectfully traversed.

As stated above, the combination of Khan and Inoue fails to teach that which the Examiner asserts, and Phillips fails to overcome the deficiencies of Khan and Inoue. Further, there would have been no motivation to modify Khan in view of Inoue. Thus, this rejection is traversed for the reasons set forth above. Applicant therefore requests that this rejection be withdrawn.

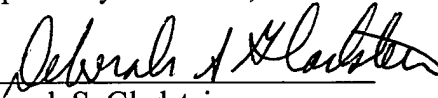
Claims 7 was rejected under 35 USC 103(a) as being unpatentable over Khan in view of Inoue and further in view of Abrokwhah, U.S. Patent No. 5,895,929. This rejection is respectfully traversed.

As stated above, the combination of Khan and Inoue fails to teach that which the Examiner asserts, and Abrokwhah fails to overcome the deficiencies of Khan and Inoue. Further, there would have been no motivation to modify Khan in view of Inoue. Thus, this rejection is traversed for the reasons set forth above. Applicant therefore requests that this rejection be withdrawn.

In the event the U.S. Patent and Trademark Office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 204552031600.

Dated: February 1, 2006

Respectfully submitted,

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Attachments

Application No.: 10/762,572

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Docket No.: 204552031600

REPLACEMENT SHEETS

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